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The Integration of an information processing system: A Case study based at the Lodge at Woodcliff

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The Integration of an Information Processing System: A Case Study Based at the Lodge at Woodcliff

by
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School of Food, Hotel and Travel Management
Department of Graduate Studies

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Abstract

To make the claim that one provides 'World Class' service is easy. Supporting that claim is not so easy if you do not have the proper tools. The Lodge at Woodcliff, a resort hotel in Rochester, New York claims to provide 'World Class' service, but does not have the facts or tools to produce the facts to support this claim.

Data has been collected related to service quality throughout the resort. This action research will attempt to integrate an information processing system at the Lodge at Woodcliff. This information processing system will enable management at the Lodge at Woodcliff to measure quality standards throughout the resort as well as make decisions based on statistics rather than senses of what is needed to be done.

Additional materials contained within this case study will provide educational support for the staff at the Lodge at Woodcliff.

Acknowledgements

I would like to thank Dr. Richard Marecki and Dr. Jim Jacobs (aka Jake) for their guidance over the past year. Both of them have a gift for teaching 'change' in the thinking process.

Most importantly; THANKS Mo and Jack for the support, love and guidance.

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Introduction:

Imagine an organization which spends the time, energy and money to collect data related to customer service, yet lacks the ability to process this information into a series of useful documents.

At present, the Lodge at Woodcliff holds a large bank of information, compiled from feedback from guests and reports completed by employees at the resort. The make-up of this data is related to customer service and/or particular departments throughout out the resort. This data offers no insight to management in its 'raw state.' Using this data bank and data continually being collected in regard to customer service; an information processing system needs to be developed to provide management with useful information by which they can make decisions related to customer service.

The puzzling question is; why would any organization spend the time, man hours and dollars to collect information, yet not have a use for the information? There is no reason for this practice to take place. With the addition of an information processing system, the transformation of this data can prove to be quite valuable to the managers throughout the organization.

Imagine this scenario: An organization which knows which mistakes it makes most frequently, when those mistakes are made and which mistakes offer the greatest amount of energy to the decrease in customer satisfaction; contributing to loss in market share. This is powerful knowledge which can turn a mediocre manager into a fantastic manager. This manager can lead his

employees through training related to these areas of growth opportunity. It is important to note that the efforts are driven by the demands of the customers themselves. Imagine that; an organization acting upon the demands of the customer. Is that not the core of the service industry?

The Problem Statement:

The Lodge at Woodcliff lacks the ability to transform 'raw' data into useful information by which managers can better make decisions. The problem is clearly defined as; data in its 'raw form' provides little useful information to managers.

Proposed Task:

The proposed task is to integrate a computerized information system consisting of a DOS based computer system and compatible statistical analysis software, which will generate statistical process control (SPC) documents and quality measurement diagrams. Also there is a need for training to be delivered throughout the entire property regarding the usefulness of the information and how it relates to decision making aimed towards higher levels of customer satisfaction.

Educating the management and staff at the Lodge at Woodcliff about the meaning and uses of information that is provided by the information processing system will be done in group seminars related to quality improvement and the tools used to assist an organization as it moves toward a process of continuous quality improvement. By understanding what the information/reports reflect, management and staff can make better marketing and operational decisions with a focus on the customer needs.

Scope/Limitations of the Research:

The data bank held by the Lodge at Woodcliff contains data related to all departments throughout the resort. This project shall reach out to encompass all of the departments on which data has been collected. The information processing system will be versatile enough to generate reports related each respective department in the resort.

Support in the implementation will be provided by means of educational seminars to the entire staff of the Lodge at Woodcliff.

The limitations set for this research are focused on the type of quality measurement taking place. The beginning stages of quality measurement involves defect management. This, in a sense is a reactive approach. This research does not attempt to measure customer satisfaction. All of the data used to generate the statistical reports related to this study represent past occurrences.

Background Information:

Simply put; the data being collected throughout the Lodge at Woodcliff contains valuable information related to customer service. In its raw form, this data does not provide any insight as to what perceptions are held by the customer.

Time, effort and monies are being spent on the collection of this data, but it sits idle; providing little to no value to managers in the organization. This is much like making an investment in a fabulous piece of equipment, putting it into a closet and choosing not to use it to provide the best quality service possible to the customer. Anytime an investment is made in a business, isn't the purpose of that investment to help the organization grow,

gain greater competitive advantage and/or improve on quality? The data being held by the Lodge at Woodcliff sits idly in a data bank, providing no growth to the organization or its efforts focused on quality improvement.

In order to transform the 'raw' data into a usable form; adding value and purpose as well; an information processing system needs to be researched, purchased, installed, customized, and understood. At present, the Lodge at Woodcliff uses DOS based computer systems throughout the resort. In maintaining compatible with the existing system, DOS based hardware and software will be sought to provide the necessary strength to support the efforts of statistical analysis and SPC.

It seems that most organizations within the service industry hold very little knowledge of what kind of measurements and measurement tools can help them compete at a more competitive level. Without overwhelming the organization members at the Lodge at Woodcliff, the presentations supporting the implementation of the information processing system will be quite simple, interactive and 'user friendly.' This will enable participants to clearly understand the value of the system as it applies to their respective departments.

The Purpose:

At the Lodge at Woodcliff, there is a need to better understand the concerns of the customer. This can be done through the analysis of the feedback that has already been collected by the Lodge at Woodcliff.

The purpose of this project is to develop an information processing system in order to convert the 'raw' data into a useful form.

Significance of the Research:

The importance of this project reaches various members of the Lodge at Woodcliff's management team as well as the staff throughout the resort.

On an operational level, this project will help prepare reports that help the entire management team to understand the critical success factors which customers indicate as contributors to a positive experience at the Lodge at Woodcliff.

Critical success factors constantly changing; by using an information processing system to track these changes, management maintains a close relationship with their customers. Without the deployment of this system, critical success factors can change without being recognized. This leads to eventual loss in market share.

More importantly, managers can use the information generated by the information processing system to make more educated decisions, with a focus on the customers needs.

Nature of the Research:

This project is a case study taking place at the Lodge at Woodcliff. It attempts to implement the use of an information processing system related to analyzing survey data and converting it into more useful and meaningful information represented by charts and graphs. This project is described as "action research," meaning that it will include the implementation of such a system, and will be supported by an education process.

Abstract of Literature Review:

The key terms used when researching this project include:

measurement, quality, quality software, statistical process control, quality tools, survey techniques, quality training, quality education, control charts and information systems.

Educational text books, current literature, periodicals, and journals are all sources that will be reviewed for information pertaining to the aforementioned topics. Writings by authors such as A.C. Rosander, Henry L. LeFevre, Peter Mears, Mary M. LoSardo and Norma M. Rossi offer guidance, stimulation and insight relative to piecing together a simple, yet effective implementation strategy for the information processing system. Two periodicals that will supply valuable reference material pertaining to the softwares available and the 'coaching' associated with the implementation of the information processing system are *Quality* and *Quality Progress*. These readings maintain an up to date outlook on the efforts associated with struggles faced by organizations when implementing quality programs. Found here is valuable information regarding not only the system requirements, but also the interpersonal requirements need to successfully implement quality programs.

Hypothesis:

If an information processing system is implemented at the Lodge at Woodcliff, then they should have the ability to derive useful and meaningful reports related to collected data.

Definition of terms:

Information processing system: a computerized system to used to analyze and generate reports related to the supplied data; as

converted from its 'raw' state

Quality tools: charts, graphs and/or techniques used in the assessment of quality in an organization (ie. Pareto diagramss, frequency charts, bar charts, control charts)

Statistical Process Control (SPC): Using generated statistics to plot changes in a particular area of service or product creation over a period of time

Critical success factors: those elements associated with a service or product which add to the success of its existence within the market place

Wholistic organization: an organization which understands its existence as a series of inter-related processes which perform simultaneously to produce its services or goods

Assumptions:

It is assumed that the management and staff of the Lodge at Woodcliff are committed to the task of using the survey data and an information processing system to better understand the critical success factors communicated by the customers and employees who supply the data.

The Lodge at Woodcliff has submitted applications for the Excelsior Award, indicating their desire to become a 'World Class' provider of service. This classification includes superior practices related to quality control and customer research. Therefore, developing the assumption that this project provides value to the efforts applied toward achieving 'World Class' status.

Procedures/Methodology:

The Lodge at Woodcliff will providing collected data that will be recoded by a team of researchers from the Rochester Institute of Technology. This provided data will be the subject of statistical manipulation in order to derive more meaningful information. The proposed software to be used for such analysis is Minitabs® statistical software, which is produced by Minitabs, Inc. Graphic displays and/or reports to be generated by the software will include Pareto diagrams, run charts, control charts, pie charts, radar charts and frequency charts. Further review and analysis will be performed by the management team at the Lodge at Woodcliff, determining the usefulness of the reports, understanding of the information contained in the generated reports and what additional support or changes need to made to successfully integrate the system into the daily operations of the resort.

To structure the progress of this project, three stages have been identified. This outline of the three stages provides an overview of the action steps which will contribute to the integration of the information processing system.

Stage One:

The initial stage of this project will conduct research relative to the information processing system. This will entail review of current periodicals; articles related to softwares, system requirements, capabilities and the compatibility of such softwares. Price benchmarking in its most simple form (comparative pricing of retail vendors within the Rochester area) will be done to determine what system hardwares are most affordable and capable of performing the desired tasks.

Stage Two:

At this point, the actions will turn toward the installing and training the operator of the system. This will be done using the manuals provided by the software manufacturer(s), on-line support, software manufacturer support systems, and experimental trial and error.

Stage Three:

To round out the implementation of this project, the final phase will support the integration of the information processing system through seminars focused on quality improvement and quality improvements tools. Special interest will be placed on what these quality improvement tools represent, and how they can alter the decision making process. These seminars will certainly reflect the goal of long term quality improvement, rather than the 'quick fix' approach to problem solving.

Chapter 2

Review of Literature

In researching the dynamics involved in the implementation of the information processing system; a number of viewpoints were established. These viewpoints touched on include financial concerns, the technological aspect of the information processing system, the interaction of the operator with the system, managerial development and the organizational needs.

Initially concern related to the dollars to be spent on this project surfaced. The July, 1995 issue of *Quality* magazine offers great insight to the costs, as well as the applications of over 350 different manufacture's software packages; all of which are related to quality. In the "Quality Software Directory," a grid format is presented indicating the abilities of the software and a suggested retail price.

The technological dimension of this project was looked at very simply. The system desired must be DOS based, easy to use and provide simple yet meaningful reports for the management team. When reviewing the the directory, key components of the software capabilities were that it provide control charts, run charts, histograms, Pareto diagrams, distribution charts, scatter diagrams and a summary of statistics. These specific reports/diagrams are considered by the management at the Lodge at Woodcliff to be easy to create, understand and provide sufficient feedback for defect management. It was found that the majority of the softwares on the market are focused on manufacturing/engineering. Furthermore; very few manufacturers of quality software provide training on the system.

From the standpoint of the operator of the system, ease of use and the availability of technical support sits high among priorities. Due to this lack of available training, software that is easy to use, as well as it being well established in industries was sought. This would enable support from the external environment (other users of the same software in the local community).

Viewing this project as an investment is simple to do. The discovery of organizational growth in terms of financial strength is supported by the gains in stock value of those companies who had received the Malcolm Baldridge National Quality Award. From an unspecified month in 1991 until September 1, 1994, stock of organizations who had received the Baldridge Award rose 99% while Dow Jones Industrials rose 41.9% and Standards and Poors rose 34.1%. (Helton,1995) The financial growth in such companies can directly be related to quality initiatives placed within each organization.

Further support for the implementation of an information processing system is highlighted by common characteristics within Baldridge Award recipients. In each of the organizations receiving the Baldridge Award, training programs focused on the application of quality tools and techniques. This led to organizational growth, increased awareness of the processes occurring within the organization and higher standards of quality.

At the beginning stages, one must ask themselves; what can such a system do for our organization? In simple terms, develop greater awareness of the variation that is present in the organization, provide feedback to make better decisions for which to combat defects and develop an understanding of the adhesive that links the processes within any organization into a system.

While conducting research, one article that stood out as providing reason for such a system. "The Role of Statistical Thinking in Management," which appears in the February, 1995 issue of *Quality Progress* (Hare, Hoerl, Hromi, Snee, 1995) clearly states the advantages given to management who perform work functions based on statistical feedback. Three objectives of statistical thinking as outlined by the article are "process thinking, understanding variation, and using data whenever possible to guide actions."

Process thinking encompasses the theories that all work is an interrelated string of events or processes, in which the majority of defects occur. The affective manager looks to correct the process in order to engineer a system that delivers the end product maintaining the desired quality. Within the processes taking place, there is variation. This is considered a given parameter. Statistical thinking strives to understand the variation; thus reducing it to the most minuscule amount. Understanding the variation is derived from data retrieved throughout the system (linked processes). Facts based on the correct amount of information guide actions aimed at improvements to the system.

Educational support which will conclude this project is enhanced by the writings of Peter Mears Ph.D. Mears authored "Quality Improvement Tools and Techniques." Here can be found a simple, progressive introduction into the uses of quality tools and techniques, such as control charts, Pareto diagrams, histograms, scatter diagrams, and distribution charts. Writings detail how these tools/techniques are created; starting with the origin of the data and followed up with an explanation of the significance and meaning of the representative chart/diagram. Comprehensive review of the tools/techniques includes how particular tools/techniques are applied, when they

are applied, and why they are applied.

Additional support pertaining to the statistical background associated with the education process is provided by the writings of Bob. E. Hayes and A.C. Rosander. Hayes provides indepth statistical knowledge, most of which focuses on the validity of the data collected, and the reports derived from the data. Rosander provides excellent examples of practical application for the quality tools/techniques. It is through valuable application of these tools/techniques that the statistical thinking process begins. Statistical thinking is developed as a behavior. By using the quality tools/techniques, behavioral patterns will change and create an environment seeking opportunities for which to apply quality tools and techniques. (Hare, Hoerl, Hromi, Snee, 1995)

There is yet one issue which cannot be left out. This is the contribution of all those involved in this information processing system. There has to be some physical labor involved with this system. Whether it be the people who collect the data, the person who creates the data file on the computer or those who receive the reports generated by the information processing system; the commitment of all involved is necessary for success. The key to this is that members are ensured that they will be heard, and that their contributions will be respected. (LoSardo, Rossi, 1993) Barriers of participation must be taken into consideration. These may consist of lack of education regarding statistics, fear of identification of problems in one's own work area, conflicting goals, personal grievances or the employees may be too close to the problem to recognize that one exists. "At the Service Quality Frontier: A Handbook for Managers, Consultants and Other Pioneers" dedicates an entire chapter to this issue; identifying techniques to be used in

gaining commitment of those involved in the process.

In an article written by Jaclyn R. Jeffrey (1995), entitled "Preparing the Front Line," motivating employees is labeled as one of three key elements to providing excellent customer service. In the fourteen organizations researched for this article, it found that one way these companies are motivating employees is to give them the information, skills, tools, and knowledge to perform their jobs effectively. When this is done; we see a paradigm shift. The manager is now servicing the employee. At this point we created an empowered employee with the confidence to perform at the desired standard and with the goals of the organization in mind.

Through active collection of data, analysis of that data, and making decisions based upon that data, managers can successfully move forward into an environment proactive in its efforts to advance quality.

Chapter Three

Stage One

Stage One of this action research is to make the decision of what computer and software to buy based upon a review of literature related to technology issues and perform a simple price benchmark study. The technology issues looked at included softwares, system requirements, compatibility and capability of softwares that provide statistical analysis in a variety of forms. A simple price benchmark study was performed to determine which software and hardware combination is most affordable as well as functional.

Both internal and external influences had a part in deciding what computer and software was to be purchased for the Lodge at Woodcliff. Outlined below are these influences and an explanation of what part each may have played in the decision making throughout stage one of this project.

Present Operating System

The Lodge at Woodcliff presently uses DOS base computers throughout the operation. Staff members who use computers as part of their daily job routine are familiar with DOS applications. Therefore it was decided that a DOS base computer would be used to perform the statistical analysis work at the Lodge at Woodcliff.

System Requirements

It was also determined through past experience and projected future needs that the computer system be at least 16K in size to store

large data banks of statistics, operate statistical analysis software, as well as many other software applications associated with the operations of the Lodge at Woodcliff.

Compatibility

The Lodge at Woodcliff uses Microsoft Windows to set up the desk top computer systems throughout the resort. The chosen statistical analysis software must be compatible with the presently used Microsoft Windows.

Capability

At the time of this study, data related to defects in service had been collected from various departments at the Lodge at Woodcliff. Initially the purpose of the statistical analysis was to reduce defects. Defect management maintains a reactive position, as it focuses on what has already taken place and requires a rather long period of time to collect a large data sample and analyze the output of the 'system.'

When selecting the statistical analysis software for the Lodge at Woodcliff, the future needs of the organization had to be taken into account. The Lodge at Woodcliff not only needed to work on defect management, but also develop a proactive strategy for managing service defects. Time and labor needs to be reduced to initiate this proactive effort. The software for this transition should be capable of providing statistical reports such as run charts, control charts and radar charts. This will allow the

Lodge at Woodcliff to become proactive in it's quality efforts.

Software

The July, 1995 issue of *Quality* magazine offers great insight to the costs, as well as the applications of over 350 different manufacture's software packages; all of which are related to quality. In the "Quality Software Directory," (Appendix A) a grid format is presented indicating the capabilities of the software and a suggested retail price. It was determined that the best software to perform the statistical analysis would be Minitabs®. Minitabs® is able to produce reports associated with defect management, as well as provide the valuable reports such as run charts, control charts and radar charts.

Early in the research, it was realized that the primary operator of the information processing system was quite intimidated by the idea of statistical analysis. In the long run of the project this did not turnout to be a problem. None the less, this had to kept in mind throughout the project. When deciding which software to use for this project, those that are more 'user-friendly' certainly offer a greater potential for success. One additional concern related to choosing software for this project is that outside help be readily available. This may be sought from industry professionals, educators and students. Therefore, it was important to use a software that is commonly used in various settings.

Price Benchmark Study

A very simple price benchmark study was performed in the Rochester, New York area. The purpose of this was to determine where to purchase the computer system in order to receive the best value for the price. Three major computer retail stores were visited. The three stores visited are Comp USA, Computer City and Lechmere. The decision was made to make the purchase at Comp USA because the value of the service, warranty and capabilities of the particular system exceeded those of the other two retail stores.

Organizational Focus:

There may be many elements which contribute to the successfully transforming any organization into a quality focused organization. Some of the more critical elements which apply to this research may be knowing what quality service is all about, understanding sampling, mastering basic tools, process thinking, involve people and lastly know how to apply all of these theories. (LeFevre, 1989) These subjects will be discussed further in Chapter Five.

Chapter Four

Stage Two

The second stage of this project focused on installing the computer system and most importantly training the operator of the system.

Installing the System and Software:

Installing the computer system and software is a much smaller task than one can imagine. When the computer system was purchased, the installation service was included in the price of the computer system. Installing the software was as simple as following the software manufacturer's directions and loading disks into the external drive of the computer. The software has the capability to place its own functioning system into the proper file(s) for operation. Installing the system and software turned out to be extremely easy.

Training the Operator:

The bigger task to accomplish during Stage Two of this project is to train the operator of the system. As stated earlier, the primary operator of the system, Jose Abarca, expressed anxiety over the idea of statistical analysis. Due to this concern, it was decided that training the operator had to come in small steps, while avoiding technical terms associated with statistical analysis.

While most statistical software may seem difficult to use, Minitabs® has proven in both private and educational settings to be

easy to operate as well as be highly functional. Having fun and generating useful information using Minitabs® was the tone set for time spent training the operator. It was not hard to convince the Jose Abarca that using Minitabs® can be fun as well as educational and inspiring. It now seems that collecting data and analyzing it has turned into a 'hobby' for those at the Lodge at Woodcliff. The toughest question asked is, "What else can I measure?"

Familiarity:

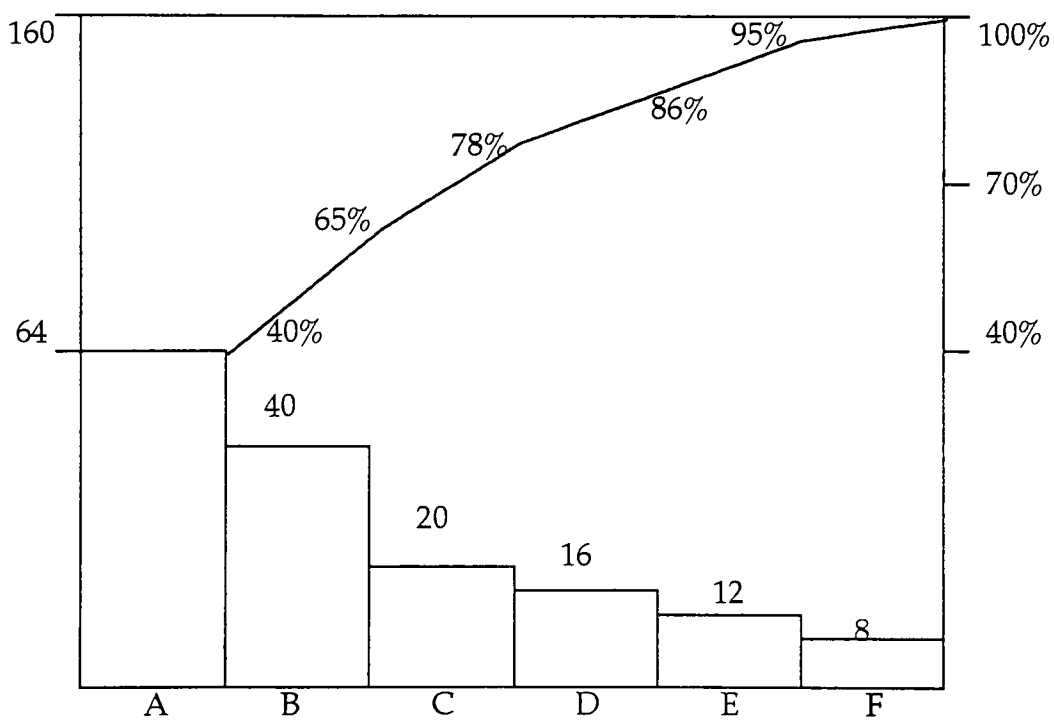
On the agenda for the first meeting with Jose Abarca was to familiarize him with the ease of Minitabs®. After spending an hour creating fictitious spread sheets of data and converting them into visual tools, Jose Abarca that using Minitabs® to do statistical analysis is extremely easy. It wasn't long before he felt comfortable using Minitabs® and seeking opportunities to exercise his new skills.

Pareto Diagrams:

The focus of the second meeting with Jose Abarca was on understanding the meaning of the generated information. Creating Pareto diagrams with Minitabs® is effortless, but understanding exactly what important information they contain may not be effortless to everyone. Appendix B contains the educational materials used to explain Pareto diagrams to Jose Abarca, as well as being offered as training tools for the remaining staff at the Lodge at Woodcliff. As was explained to

Jose Abarca, Pareto diagrams simply provide information highlighting the major contributors to the subject being analyzed. (Mears, 1995) This tool allows any organization to choose a starting point for problem solving, monitoring success or identifying the basic cause of a problem. (Brassard,1988) The illustration in Figure 4.1 is an example of how the Pareto diagram may be used. Data has been gathered on the subject of defects occurring in the rooms division of the resort. A Pareto diagram such as the one below may be created using the collected data.

Rooms Division Complaints (Figure 4.1)



A: Room not clean
B: A/C not working
C: Television not working
D: Desk staff not courteous
E: No hot water
F: Tub/sink not draining

As illustrated by the above Pareto diagram, the most frequently occurring complaint pertains to guest rooms not being sufficiently cleaned. The second most frequently occurring complaint pertains to the A/C not working properly in the guest rooms. This indicates that trouble shooting energy should be focused on properly cleaning of rooms and correcting the A/C problems.

In order to monitor successes related to these individual subjects it is necessary to compare data collected during different time periods. This will indicate if problem solving efforts have been successful.

Using Pareto diagrams to identify basic causes to a problem may involve the use of process flow charting. Understanding the process taking place in order to clean a guest room may help to identify the root cause of the problem.

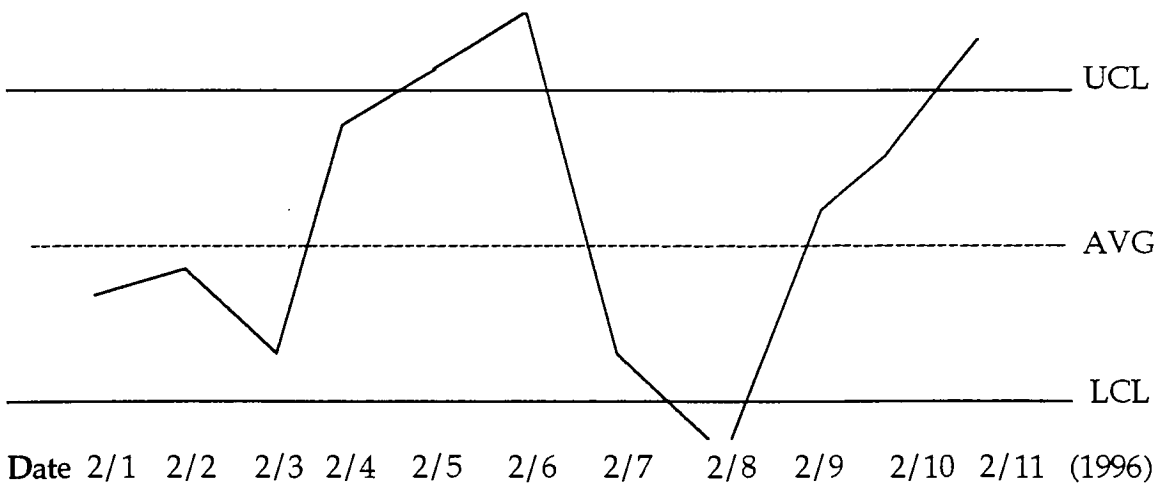
Pareto diagrams can offer a variety of information; valuable to measuring the quality services/goods in any organization.

As stated earlier, additional educational materials are contained in Appendix B. These materials demonstrate the versatility of Pareto diagrams for use in the various departments throughout the resort.

Control Charts:

The second meeting with Jose Abarca detailed the creation of control charts with the use of Minitabs® as well as the significance of the information contained within these graphic illustrations. A control chart is essentially a visual display of a process, indicating whether or not the process is within statistical control. The data contained within the graphic illustration represents samples taken over a period of time. A simple example of how a control chart could be used is given below. The subject being analyzed is the number of dinner reservations received for the dining room at the Lodge at Woodcliff.

# of Dinner Reservations in Dining Room (Figure 4.2)



As illustrated in Figure 4.2, on the day of February 6, 1996 there was a unusually great number of reservations taken for dinner service in the dining room, reaching beyond the upper

control limits (UCL). On the date of February 8, 1996 there was an unusually low number of reservations taken for dinner service in the dining room, reaching beyond the lower control limits (LCL). The use of this information is to identify out of control occurrences, such as the two dates identified, as well as highlight trends which may occur. These out of control occurrences as well as trends may be caused by a variety of reasons which can be identified through examination of the variables which effect the process. The next logical step here may be to chart the collected data as it relates to particular days of the week. This may lead to further identification of out of control processes or trends.

Additional educational materials related to control charts offered in Appendix B.

Radar Charts:

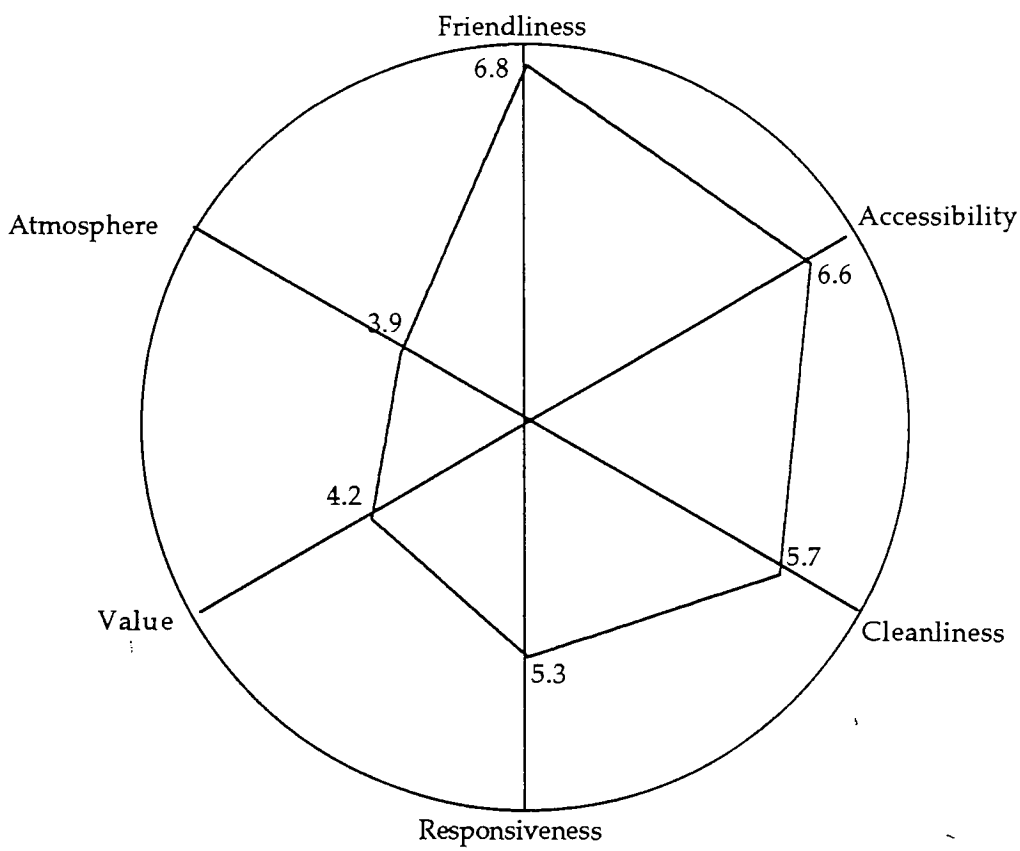
The purpose of the final meeting with Jose Abarca was to discuss radar charts. Radar charts are a form of pie chart which have data plotted along the the slices from the center of the pie. Each slice is representative of a question. The response to the question is the data point plotted. Figure 4.3 is a radar chart illustrating the responses that may have given by guests who had attended a banquet function.

Figure 4.3 indicates that guests were most satisfied with the friendliness of the staff, identified by a score of 6.8. Guests were least satisfied with the atmosphere provided during the

banquet function, identified by a score of 3.9. What this radar chart tells us is that efforts should be made to enhance the atmosphere of the banquet facilities.

Radar charts a frequently used to display data retrieved from surveys using a Likert Scale to capture the level of satisfaction of customers. There is a great possibility that in the future, Jose Abarca will be analyzing survey data with the help of Minitabs®. Radar charts are just one simple method by which survey data can be quickly translated into a more meaningful form.

Figure 4.3 Radar Chart of Banquet Function Survey



Chapter Five

Stage Three

Stage Three of the proposed project is to integrate the information processing system throughout the resort. The actual actions taken to integrate the system must to be initiated by the management of the resort. More interesting to the process of integration may be the resistance to conform. As it is difficult to fully participate in the process of integration, valuable information related to successfully accomplishing the task may be sought to better the chances of success.

Integration:

Resistance to Conform:

Instituting change in any environment is not an easy task. Resistance to conform is a natural reaction of many employees that have been working in an environment with a strong hierarchal structure. Asking them to communicate freely and provide information about their work without fear of punishment for less than adequate performance is a tough concept for many employees to buy into.

Creating the Right Environment:

Because of the natural resistance to conform, it is necessary to create an openness which encourages honesty, accountability and

empathy.

Speaking the truth and presenting real scenarios related to the processes taking place in an environment helps everyone involved in process improvement efforts to understand the challenges faced by each individual on a day to day basis. The more details an employee can provide about their work environment, the more likely it is that others can contribute to the improvement of that environment. A realistic display of the work environment and its processes is a great start to process improvement.

Developing an understanding within each individual that they are accountable for their work environment and the processes contained within it is very important to conformity. When getting together to discuss practices that take place in an environment, it should be done with the understanding that only they know that work environment well. Afterall, they are the owners of that work station. Measure the changes that occur under the control of each individual in that environment. The successes that come to exist in that work environment are due to their hard work, and commitment to make improvements. Because they own the process, they shall celebrate its successes.

In order to fully understand the challenges faced within any work environment, it is vital that those coaching teams through process improvement put themselves in the shoes of others. Imagine yourself in their positions, performing the same tasks they do everyday. Can you feel their sense of frustration? What can be done to better that work environment? Can you understand how the process

came to exist in its present form? Is it in need of total reengineering or just some minor adjustments? By understanding the challenges faced by those individuals, one can better understand the tasks needed to be performed to make improvements. This understanding is known as empathy.

Management's Challenge:

It is the challenge of the management team at the Lodge at Woodcliff to create an environment rich in honesty, accountability and empathy to start the improvement process. Without these principles in place, it would be a waste of energy to implement any quality initiatives within their work environment. Soliciting buy-in from employees has to be sincere, rewarding and inspiring. Like marketing any intangible product, quality has to have its positive impacts enhanced. Through free communication of the challenges to be faced, aligning individuals with organizational goals and displaying the rewards, an organization with a 'quality first' attitude may transpire.

For all the techniques, training or ideas that may exist in an organization, none of them will prove to be affective if the people within the organization can't work together for a common reason. (Lizard, Ross, 1993)

Organizational Focus:

As mentioned at the end of Chapter Three, the writings of Henry LeFevre suggest that there be six critical success factors which must be present during the transformation of any organization into one with a

quality focus. Discussed here are the six elements which can have an impact on the survival rate of quality initiatives.

Know what Quality Service is All About:

To initiate quality, we must have a strong understanding of what quality is. Quality varies depending on the industry, market, organization, organizational goals, competitors standards and most importantly, customer standards. Having a firm understanding of expectations and how quality is affected by outside variables allows us to focus our efforts on the important issues which contribute to the processes which take place within our environment.

Understanding Sampling:

Sampling is a important part to collecting valid data to measure quality. Continuous sampling:

- allows for less disruption to a process due to smaller sampling sizes.
- accelerates responses to problems and efficiency to solving those problems.
- identifies quality performance in terms of workers, steps in a process or meeting work standards.
- identifies special needs that may require additional training, redistribution of work tasks or resources.
- helps to set realistic goals which fluctuate depending on feedback and reward milestone achievements.

Mastering Basic Tools:

Research has told us that one of the factors contributing to the success of individuals within their jobs is the mastering of quality tools. (Jeffrey, 1995) Providing workers with the tools to succeed is important. Just as important may be the inspiration provided to workers to apply these tools and make them part of their everyday work environment. It is important to fully understand and know how to apply quality tools.

Process Thinking:

Understanding the steps which take place in a process make it easier to apply quality tools. Identifying measurements, knowing what tool to be used to determine level of quality being maintained and where opportunities for improvement exist are all part of process thinking.

Involving People:

Single-handedly is not the approach to take when looking to initiate a quality campaign. There are owners of the processes which take place in a work environment. Consulting those closest to the processes often provides the most realistic understanding of the process itself. Reach a level of accountability for what takes place during a process. This will facilitate participation in quality efforts. To state goals and monitor the rate of achieving them is not enough. Surround yourself with the contributors to a process. At this level,

coaching sits high on the list of priorities.

Know how to Apply the Critical Success Factors:

Adjusting and fine tuning play a major role in the implementation of any quality initiatives. Custom fitting the previously mentioned critical success factors into your organization requires a great understanding of your organization and the dynamics contained within it. Applying these critical success factors differs in every case. The role of management during the initial implementation may be to educate everyone involved about what the goals of such new practices are, how the changes in their environment will affect them and the long term impacts it may have. Educating the workforce may be the adhesive which transforms an organization into one with a 'quality first', 'wholistic' organization.

Education:

Educating and training people how to succeed in a new environment is very important. Essentially, the rules of the game are changing. (Marecki, 1995) Integrating new strategies into a work environment means that there is reason to support employees with new tools for success. When instituting quality strategies in the work environment at the Lodge at Woodcliff, quality tools can aid in the rate of success of those individuals working in the environment. Supplied in the appendixes of this written report are materials which can be used during educational seminars.

By giving staff members a strong understanding of quality tools and

their uses, the Lodge at Woodcliff is one step closer to implementing its information processing system. To reiterate the writings of Hare, Hoerl, Hromi and Snee; actions based upon statistical data provide managers with a higher rate of success. These quality tools will provide managers with the statistical reports needed to make good decisions based on the data.

Identifying Measurements:

Identifying measurements is not a difficult task. There are so many opportunities to collect data related to the many processes that are taking place within any environment. What is most important to identifying measurements is that the data collected is capable of producing information of value.

Taking measurements related to the steps in a process help to understand where the opportunities for improvement exist within that process. To begin this process of identifying measurements, it is a good idea to map out or flow chart the process being studied. When all the steps within the process have been laid out, we can look at each one individually and determine what makes each step successful in its contribution to the process. Question the integrity of each step in terms of its cost, time efficiency, labor usage or even its impact on the other steps within the process. With a focus on service industries, move yourself through the process as if you were creating the service.

Fully understanding the the process which creates the service allows you to feel the impact of inefficient steps within the process. To identify the measurements within the steps, sense the restraints which exist and ask yourself, 'how do I measure this restraint?' Is it a time

issue or perhaps multiple steps being accomplished at once? Is this costing more money than it should? Does the output of this step have certain quality goals that should be monitored? What is the measurement of that goal?

Once measurements are identified, we can move into the uses of quality improvement tools and techniques. Without the focus of what is the subject to be measured, a lot of time can be spent collecting meaningless data and generating meaningless reports. That is a practice as useless as not using the data at all.

Background Information Related to Quality Tools:

What are the quality tools which will be used to measure quality at the Lodge at Woodcliff? What do these graphic illustrations represent? How can we use them to make decisions? Do these statistical reports provide us with information about the future? Are there various ways to apply these tools in our environment? These questions will be answered for each of the quality improvement tools focused upon.

Pareto Diagrams:

A Pareto diagram is a graphic illustration of the conditions which contribute to a problem. It is represented in the form of a bar chart. The primary purpose of the Pareto diagram is to identify the major contributors to a problem.

By identifying the major contributors to a problem,

decisions can be made as to where to direct efforts that will have a significant impact on the reduction of the problem.(Brassard, 1998) By comparing charts of the same data from different periods of time, it is possible to recognize improvements, negative impacts or trends that may exist.

Pareto diagrams can be valuable in many work environments. Pareto diagrams can be used to identify contributors to problems occurring in just about any process. (Brassard,1988) Pareto diagrams can help to see where future improvement efforts are going to be focused. When trends are recognizable within Pareto diagrams, we can develop an understanding of what may happen down the road. Trends are not always accurate, but certainly offer some information of value. Because trends focus on past patterns, they suggest what may occur in the future.

Some examples of the uses of Pareto diagrams are described in Appendix B.

Control Charts:

A control chart is a graphic illustration representing the variability contained within a process. Its primary purpose is to determine the consistency of a process over a period of time. Control charts contain upper control limits (UCL) and lower control limits (LCL), which are statistically determined. When a process falls outside those limits, it is known to be out of control. The focus of the control chart is on consistency.

One of the truly attractive aspects to using control charts is that they do not need a large sample of data to be collected. Control charts are generated using a small sample size to determine the consistency of the process being examined.

Control charts are used to make the decision as to whether or not a process is out of control. In other words, when a process is altered by one or more of the variables within it, it may fall outside of the control limits. This indicates that the process is in need of examination. This may be the first step to identifying the root causes of a problem. Identifying the root causes may call for the employment of other quality improvement tools which more closely examine the variables contained within a process.

Trends which exist within control charts indicate that the variables which alter the quality of a process may be cyclical. We can view the reoccurrence of the kind of defect which creates a trend and learn about its existence. By understanding when and how a variable affects the process being studied, we can reduce the impact it may have on the process.

Some of the environments where control charts may be used are manufacturing, health care, insurance, human resources, food service, and even urban development.

Some of the more typical applications of control charts within a resort environment are presented in Appendix B.

Radar Charts:

Radar charts are a form of pie chart illustrating the scores

of a survey which has been conducted. Decisions can be made based upon the changes of scores over time, the prioritizing of categories or the needs of customers.

There is an endless variety of ways to employ radar charts in a resort setting. Figure 4.3 suggests that it be used to analyze a survey conducted related to banquet functions. Radar charts can be used to view the differences in scores between market segments at the resort, perceptions of service quality between departments at the resort or the different levels of job satisfaction throughout the staff at the resort.

Radar charts are easy to produce and can give a glimpse of the here and now. Using radar charts to understand the future is more difficult. Market changes, changes in work environments and implementation of strategies can have an affect on the responses received on surveys. We can use radar charts to identify the affects of the changes and forecast the reactions to such changes.

Some of the more simple applications of radar charts that can be used in a resort setting are provided in Appendix B.

Chapter Six

Summary, Conclusions and Recommendations

There may be many ways to institute quality within any organization. One of the many tools needed to determine quality is measurement. At the Lodge at Woodcliff, the implementation of an information processing system is certainly a value added to the quality efforts being employed.

Claiming to provide 'World Class' service without the ability to provide the data to support is has been a practice at the Lodge at Woodcliff. With the help of this information processing system, management at the Lodge at Woodcliff can not only support their claims, but monitor the changes that occur as well as look forward to the future by recognizing and understanding trends within their environment.

Summary:

In Chapter One, we discussed the thirteen points which comprise this study. The most note worthy contributors to this section of the document are the problem statement, the proposed task, the purpose, the significance of the research and the procedure/ methodology. The linking of these five elements form the foundation for the study. When reflecting on the writings, it is difficult to ignore the interdependence of these elements and their substantial contribution to the overall task at hand.

Linking together the thirteen points of rationale from Chapter One is the review of literature, contained in Chapter Two. A simplistic approach was adhered to when researching the theories/ practices which support the implementation of an information processing system. A great deal of emphasis was placed on keeping the action research simple, easy to understand and well within the mental reach of those benefiting from its existence.

Chapters Three, Four and Five represent the procedure/ methodology guidelines worked within for the project. Outlined below are the subject matters which started out as a mental model and finally transpired into writings.

Chapter Three - Stage One:

- Research the organization's needs.
- Research the information processing system's needs.
- Benchmark the cost factors associated with the purchase of the information processing system.
- Organizational Focus

Chapter Four - Stage Two:

- Install the information processing system.
- Train the operator on the operations/applications of the system.

Chapter Five - Stage Three:

- How to identify what to measure.
- Integrate the system:
  - Focus on resistance to conform.
  - Creating the right environment.

Chapter Five - Stage Three (cont.):

- Management's Challenge
- Organizational Focus
- Organizational Focus (critical success factors)
    - Know what quality service is all about
    - Understand sampling
    - Mastering basic tools
    - Process thinking
    - Involving people
    - Know how to apply critical success factors
- Education
    - Identifying Measurements
    - Quality improvement tools:
        - Understanding of tools:
            - What are the tools?
            - What do these graphic illustrations represent?
            - How can these tools be used to make decisions?
            - What are the various ways to apply these tools in a working environment?

Conclusions:

Previous research supports the theory that developing a good understanding of quality tools and their applications among employees

will increase job satisfaction, provide valuable tools needed to succeed in a work environment and most importantly, motivate employees. (Jeffrey, 1995)

Integration of this information system and all the possible quality initiatives which accompany it is a difficult process. The keys to bringing this research a reality may be a change in the work environment in terms of how personnel operate on a day to day basis and educating everyone involved in the quality efforts being employed.

Recommendations:

Because the Lodge at Woodcliff has not had the ability to transform raw data into meaningful information, recommendations could be endless. Keeping recommendations simple is very important, so those involved with the project at the Lodge at Woodcliff are not overwhelmed.

The work environment at the Lodge at Woodcliff must undergo some changes. An environment conducive to continuous improvement and lateral communications must be created. This may start with an education process. This education process should not be limited to management. Sharing the wealth of the education process with all staff members may be the opportunity to breakdown barriers between management and staff; leading to open communication.

An education process related to the implementation of this information processing system at the Lodge at Woodcliff should take place. Any staff members who are affected by its existence should be

involved with this education process.

The focus of the training should be on:

- what quality means to the Lodge at Woodcliff.
- what the information processing system do.
- how to identify measurements.
- what is meant by quality improvement tools.
- defining the logistics of quality improvement tools
    - what they represent
    - how decisions can be made using these tools
    - how to apply quality improvement tools
    - what quality improvement tools tell us about the future.

During the education process develop three key elements. These elements are necessary for quality improvement. These three elements are honesty, accountability and empathy.

Before venturing into unfamiliar territory, its very important to have a map. Know where the staff stands as far as their understanding of the six critical success factors, outlined in Chapter Five. Make sure that all six elements exist in the work environment and have reached a level of comfort with everyone involved. Two good questions to ask are, "Do you know where you stand at this moment?," and "Do you know where you are going with those tools?"

When the time arrives to exercise these newly learned skills, it is important to support the efforts through coaching. Persistent guidance, cheerleading and celebrating of successes is important to motivating employees.

Success must be recognized. Rewards should be clearly displayed. One of the lacking motivators at the Lodge at Woodcliff are rewards and recognition. (Lakowski, 1996) Everyone who contributes to improvement at the Lodge at Woodcliff should be rewarded. Rewards should reach far beyond the management levels and be ingrained into the work environment.

Make measurement part of the everyday work environment. Inspire the staff find new ways to measure performance and track performance. Do not forget to celebrate the successes. Do not forget to learn from mistakes.

Use the information processing system to identify and understand trends. Use that trend analysis to plan for the future. Long term planning for quality requires the forecasting of the future.

Throughout the resort, make it clear that quality efforts are focused on long term results. Establishing standards through quality initiatives is just the start to process improvement. Improvement requires change to occur. Hopefully, it is a change in a positive direction.

Lastly, it is important to understand that everyone who enters the work environment at the Lodge at Woodcliff must be educated about the use of the tools for quality. Make this part of the initial training process for every new employee.

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Appendix A

Quality Software Directory

Comp./Sftwr. Name	Anova	Box Plot	Cause & Effect	Correlation	Parameters	Expert System	Hypothesis Test	Multi-vari	Non-normal dist.	Normality test	Regression	Simulation	T test for means	Taguchi	Reliability	Attribute charts	Variable charts	Short run	Distribution	Histogram	Normal probability	OC curves	Pareto	Probability	Summary stats.	Scatter diagram	Cost
Concert Corp.- QE-100								•	•	•						•	•		•	•	•		•		•	•	$995.00
Manugistics Inc.- Statgraphics	•	•		•	•		•	•	•	•	•		•			•	•	•	•	•	•	•	•	•	•	•	$995.00
Lionheart Press- Quality Control & Ind. Exp.	•	•		•	•		•	•	•	•	•		•	•		•	•		•	•	•	•	•	•	•	•	$145.00
Minitabs- Minitabs Stats.	•	•	•	•	•		•	•	•	•	•	•	•			•	•	•	•	•	•		•	•	•	•	$950.00
Quality Int.- Quality Analyst	•			•			•	•	•	•	•		•			•	•	•	•	•	•		•	•	•	•	$645.00
SPSS Inc.- SPSS for Windows	•	•	•	•	•		•	•	•	•	•					•	•		•	•	•		•	•	•	•	$695.00
Teque- SPC	•	•		•	•		•		•	•	•		•			•	•	•	•	•	•			•		•	$595.00
PQ Systems- SQCpack for Windows									•	•						•	•		•	•				•	•		$550.00
Stat. Graphics Corp.- Statgraphics Plus 7.0	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	$895.00
NW Analytical- NWA Quality Analyst		•		•			•		•	•	•		•			•	•	•	•	•	•		•	•	•	•	$795.00
Integrated Quality			•								•					•	•	•	•	•			•		•	•	$350.00

Appendix B

Pareto Diagrams:

Pareto diagrams are a form of bar chart which helps to identify which factors contribute the greatest amount of energy to the process being analyzed. Pareto diagrams work with data which represents the past, therefore it is a reactive approach to quality research.

Pareto diagrams can be used to determine where to focus initial quality efforts, solve problems, monitor success or identify basic causes of a problem.

Below is an example of how a Pareto chart is formulated. A step by step description of how the data is manipulated to produce useful information in the form of a graphical illustration.

At Lenny's Diner, a survey was performed to determine what elements of the service environment make a unpleasant dining experience. The tally sheet of the responses is provided in Figure AP.1.

Figure AP.1 Tally sheet for Lenny's Diner

Mon	Tues	Wed	Thurs	Fri	Sat	Sun
@ @ @ @ @ % % % % % & & # #	@@@ %&& &&& &&& &&#	@ % % % & & & & & & & # #	@@@ %&& &&& &&& &&&	@@@ %%% %%& &&& &##	@%% &&& &&& &&# #	@@% %%% % & & & & & & & #

@ - Service was slow
& - Food was cold
% Server was unfriendly
# - Waited too long for table

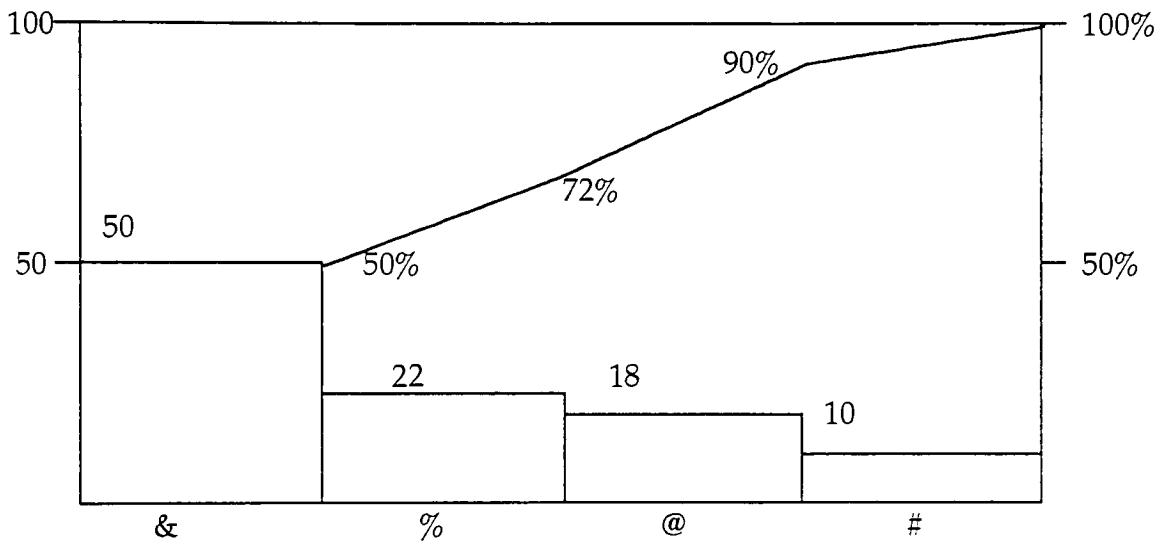
When the physical count of these defects is recorded, we determine which defects occur most frequently.

@ Service was slow (18) % - Server was unfriendly (22)

& - Food was cold (50) # Waited too long for table (10)

Already we can see that cold food is the most frequently occurring defect at Lenny's Diner. When a Pareto diagram is created, it is easy to visualize which defect is the major contributor to an unpleasant dining experience. this is illustrated in Figure AP.2

Figure AP.2 Pareto Diagram of Defects at Lenny's Diner



By visually observing the data we see that the food being cold is the most significant contributor to an unpleasant dining experience. This visualization of the data allows us to better understand and interpret the data in order to make good decisions based on that data.

An example of how a spreadsheet may look for this data to be converted into a Pareto diagram is provided in Figure AP.3 on the following page.

Figure AP.3 Defects at Lenny's Diner - Spreadsheet

	C1
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
20	1
21	1
22	1
23	1
24	1
25	1
26	1
27	1
28	1
29	1
30	1
31	1
32	1
33	1
34	1
35	1
36	1
37	1
38	1
39	1
40	1
41	1
42	1
43	1
44	1
45	1
46	1
47	1
48	1
49	1
50	1
51	4
52	4
53	4
54	4
55	4

Figure AP.3 Defects at Lenny's Diner - Spreadsheet

	C1
56	4
57	4
58	4
59	4
60	4
61	3
62	3
63	3
64	3
65	3
66	3
67	3
68	3
69	3
70	3
71	3
72	3
73	3
74	3
75	3
76	3
77	3
78	3
79	2
80	2
81	2
82	2
83	2
84	2
85	2
86	2
87	2
88	2
89	2
90	2
91	2
92	2
93	2
94	2
95	2
96	2
97	2
98	2
99	2
100	2

Control Charts:

Control charts allow us to determine the consistency of a process taking place within an organization. Through the gathering of measurements related to the process and manipulation of the gathered data, we can determine if the process is out of control or not.

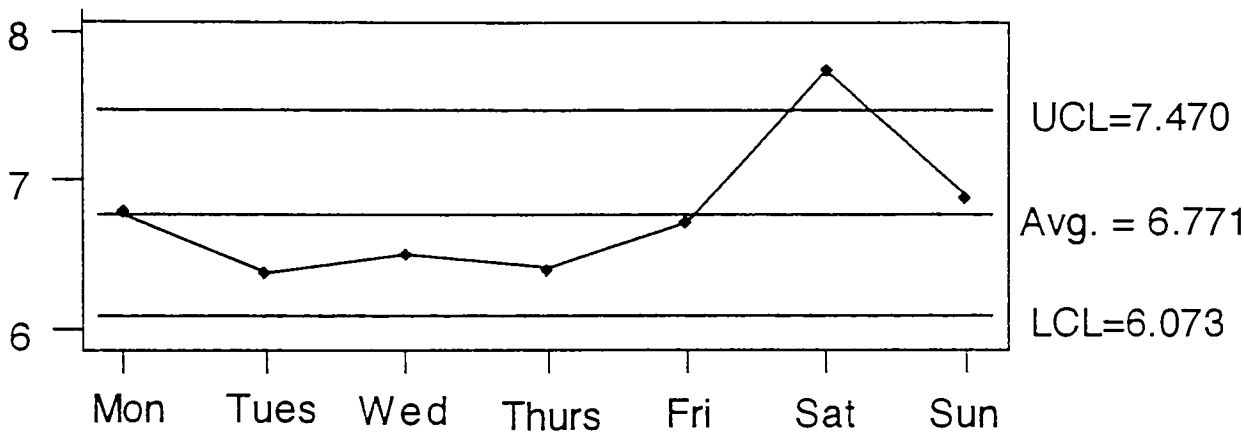
The data set presented below represents samplings of the weight of chicken breast served on a Chicken Caesar Salad at Jocco's Grub Pub.

Day	Sample Values	Avg.
Monday	6.2, 6.5, 6.8, 7.4, 7.9, 5.9	6.8
Tuesday	5.7, 5.4, 5.9, 6.9, 8.0, 6.3	6.4
Wednesday	6.3, 6.1, 7.7, 6.9, 6.1, 5.9	6.5
Thursday	6.3, 6.5, 6.6, 6.1, 6.3, 6.6	6.4
Friday	6.4, 7.1, 6.9, 6.6, 6.8, 6.5	6.7
Saturday	7.3, 7.9, 7.8, 7.5, 7.9, 8.1	7.8
Sunday	6.6, 7.4, 6.9, 7.1, 6.5, 6.8	6.9

Avg. of avg. = 6.77

We shall use our manipulated data to determine the statistical limits of the process. These limits are known as the upper control limit (UCL) and the lower control limit (LCL). Those data points which are plotted outside of the UCL or LCL are considered to be out of control. In Figure AC.1 the data points from the above data sample are plotted in a control chart.

Figure AC.1 Ceasar - Chix Portion



The statistically determined upper control limit is 7.5 and the lower control limit is 6.1. The statistically determined average of the means is 6.8. In Figure AC.1, the data point which represents the Saturday sampling falls outside of the upper control limit.

What does an out of control process tell us? Out of control may mean that one or more of the many variables which contribute to the process have fallen outside of the quality standards. There are times when processes fall out of control for no apparent reason. Once again, the usefulness of control charts is identify times when a process has been altered by one or more of the many variables which contribute to it.

An example of how a spreadsheet intended for use with a control chart would appear is provided in Figure AC.2.

Figure AC.2 Ceasar - Chix Portion Spreadsheet

	C1
	Czr-Chix
1	6.2
2	6.5
3	6.8
4	7.4
5	7.9
6	5.9
7	5.7
8	5.4
9	5.9
10	6.9
11	8.0
12	6.3
13	6.3
14	6.1
15	7.7
16	6.9
17	6.1
18	5.9
19	6.3
20	6.5
21	6.6
22	6.1
23	6.3
24	6.6
25	6.4
26	7.1
27	6.9
28	6.6
29	6.8
30	6.5
31	7.3
32	7.9
33	7.8
34	7.5
35	7.9
36	8.1
37	6.6
38	7.4
39	6.9
40	7.1
41	6.5
42	6.8

Radar Charts:

Radar charts are a form of pie chart which have data points plotted along the slices from the center of the pie. Each slice may be representative of a question asked on a survey, a market segment, a particular department or a particular service provided within an organization.

Radar charts can be used to visualize differences which may exist, the priorities of customers or which areas of service need improvement.

Radar charts are a very efficient way of translating survey data into meaningful information.

Formulating a radar chart is not difficult. Below is an example of a Radar chart illustrating the differences of guest satisfaction levels between departments at a hotel.

The data used for this radar chart came from survey cards collected throughout the hotel. The points plotted on each slice of the pie were determined by calculating the average score of one particular question related to satisfaction of services received within a specific department at the hotel.

Department	Avg. Score
Sales	7.2
Housekeeping	6.8
Engineering	5.9
Dining Room	5.0
Front Office	4.0
Banquet/Catering	3.5

Figure AR.1 illustrates the above data as it would be plotted in a Radar Chart.

What Figure AR.1 indicates to us is that emphasis should be placed on determining what makes banquet/catering customers satisfied. Once that has been determined, additional efforts can be made to improve the services within that department in order to meet the expectations of the customers. We can also note that the front office department has a rather low score also. This is also an indicator that the front office needs better understand their customers' needs and work toward meeting those needs.

Figure AR. 1 Radar Chart of Guest Satisfaction Levels by Department